MANITOBA RESEARCH COUNCIL

Where science gets down to business.

MANITOBA RESEARCH COUNCIL

MANITOBA RESEARCH COUNCIL

ANNUAL REPORT

1990/91

LETTER FROM THE CHAIR

June 30, 1991

Honourable E. Stefanson
Minister
Industry, Trade and Tourism
Room 358 Legislative Building
Winnipeg, MB
R3C 0V8

Dear Mr. Stefanson:

I am pleased to submit for your consideration the Annual Report of the Manitoba Research Council for the fiscal year ended March 31, 1991.

Sincerely,

R. Hood
Chairman

92-03989/

TABLE OF CONTENTS

CORPORATE PROFILE 1

CHAIRMAN'S REPORT 4

MRC SERVICES 6
- ENGINEERING SERVICES 6
- ENVIRONMENTAL MONITORING AND ANALYTICAL CHEMISTRY SERVICES 7
- NATIONAL AGRI-FOOD TECHNOLOGY CENTRE 7
- TECHNICAL INFORMATION AND ADVISORY SERVICES 8
- MRC - UNIVERSITY OF MANITOBA JOINT PROGRAMS 9

1990/91 HIGHLIGHTS 11

THE BOARD OF DIRECTORS 16

MRC STAFF 17

MANITOBA RESEARCH COUNCIL LOCATIONS 19

AUDITOR'S REPORT 1990/91 20

CORPORATE PROFILE

Working closely with industry, government and universities, the Manitoba Research Council (MRC) plays a lead role in encouraging and facilitating scientific research and technological development. As an agency of the Province of Manitoba, MRC also advises the government on developments in new technologies as they relate to the economic and social development of the province.

In its role as the Province's Science and Technology Advisory Council, MRC has prepared science and technology policy recommendations for consideration by the Province, and has completed the consultation process on the draft National Science and Technology Action Plan. In addition, MRC promotes science and technology awareness through involvement and financial support of several activities including the provision of award medals and scholarships to the Manitoba Schools' Science Symposium.

Through its operating units, MRC assists industry in the development and implementation of appropriate technology. MRC provides food technology services from its facilities in Portage la Prairie and engineering and environmental monitoring and analytical chemistry services from its Winnipeg facilities. MRC has co-operative initiatives with the University of Manitoba in both the Mechanical Engineering Department and the Food Science Department.

ENGINEERING SERVICES (Winnipeg)

- Advanced Manufacturing Technology
- Microgravity/Materials Research
- Electronic Design
- Equipment Retrofit
- Finite Element Analysis
- Mechanical Design
- Printed Circuit Board Layout
- Software Development
- Vibration Analysis
- Integrated Circuit Design
- Machine Design
- Material Engineering
- Noise Analysis
- Physical Testing
- Prototyping
- Surface Mount Technology

ENVIRONMENTAL MONITORING AND ANALYTICAL CHEMISTRY SERVICES (Winnipeg)

- Air Quality Monitoring
- Hazardous Waste Analysis
- PCB Analysis
- Environmental Chemistry
- Leachate Testing
- Trace Metals and Organics
- Security Analyses

NATIONAL AGRI-FOOD TECHNOLOGY CENTRE (Portage la Prairie)

- Product Feasibility Studies
- Ingredient Sourcing & Evaluation
- Recipe Development
- Colour, Viscosity & Texture Testing
- Quality Assurance Programs
- Plant Sanitation Audits
- Shelf-Life Studies
- Regulatory Compliance Assistance
- Product Formulation
- Consumer Preference Studies
- Process Development
- Test Market Production
- Nutrition Labelling Assistance
- Pesticide Residue Detection
- Chemical & Microbiological Assessments

TECHNICAL INFORMATION AND ADVISORY SERVICES (Winnipeg and Portage la Prairie)

- Technology Transfer Services
- Computer Data Searching
- Information Sourcing
- Interlibrary Loans
- Literature Searches
- Technical Evaluations

CO-OPERATIVE INITIATIVES

- University of Manitoba
  - Advanced Industrial Materials Program
  - Institute for Technological Development
  - Agri-Food Biotechnology Program

- National Research Council of Canada
  - Industrial Research Assistance Program
  - Research Institute Support Program

CHAIRMAN'S REPORT

The 1990/91 fiscal year saw the beginning of an important redirection and restructuring process for the Manitoba Research Council. The Board of Directors concluded, based on a detailed review of current operations, and on continued discussions with the Province that the MRC should strengthen its role in support of technology-based economic development in Manitoba.

The MRC implemented a significant reorganization of management responsibilities and operations late in the year. Most notably, I wish to welcome, on behalf of the Board, Dr. Jim Reichert as Acting President, and Mr. Bill Kinnear as Acting Vice-President of Finance and Administration. With their support the MRC initiated the development of a plan to establish new directions for the Council's technical operations.

From an operational perspective, a strategic decision was made to reprofile MRC's food centre as a distinct entity in recognition of the importance the agri-food industry plays in Manitoba. To begin the process a new name was selected for the Portage operations, the National Agri-Food Technology Centre. Also, several steps were taken to implement a service rationalization and fiscal restraint program to keep operational expenses in line with the fiscal realities currently facing all government departments and agencies.

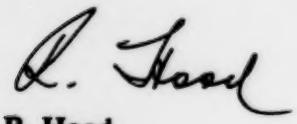
The Manitoba Research Council continued in its role as the Science and Technology Advisory Council to the provincial government. The MRC represented the Province on the National Forum of Science and Technology Advisory Councils and assisted in the development of a National Science and Technology Framework for Action.

The importance of MRC's technology transfer and advisory activities to local industry was also re-emphasized during the year. MRC made over 10,000 significant contacts with local companies last year in its technology advisory capacity. Many of these contacts were in rural Manitoba. In recognition of the importance of this provincially-funded activity, MRC initiated the development of a new reporting system to demonstrate the economic benefits accruing to the province as a result of this work.

I wish to acknowledge the extensive time commitment made by all Board members in accepting the challenge of providing direction to MRC, and in developing the advisory role on science and technology to the provincial government. I also want to thank the following board members who retired from the Board during the year: Mr. John Ingraham, Mr. Bert Beattie, Dr. Nancy Craven, Mr. George Ubell, Dr. Ken Pulfer, and Mr. Derek Johannson.

On behalf of the Board, I would like to express our appreciation to all MRC staff for their dedication to building the Manitoba Research Council as a major source of technical assistance for industrial development in Manitoba, and for their continued support in the restructuring process we have begun.

In conclusion, I would like to express the appreciation of the Board to the Honourable Eric Stefanson, Minister of Manitoba Industry, Trade and Tourism for his guidance and support.



R. Hood
Chairman

MRC SERVICES

The Manitoba Research Council provides industry and government with technical information, advisory and contract services. The MRC's services and activities are designed to promote economic development through the adoption of appropriate technology by the private sector. Services include the sourcing of information on products, components and patents for local industry and entrepreneurs; the provision of advisory services to address specific technical problems facing industrial clients and conducting projects on a contract basis for industrial and government clients in Manitoba, other parts of Canada and the world.

MRC also assists companies in testing their products for compliance to many national and international standards and regulations. MRC is accredited by the Standards Council of Canada for a large range of mechanical, physical, chemical and metallurgical tests. Specialized testing programs can be developed to suit specified clients' needs.

ENGINEERING SERVICES

The Manitoba Research Council provides engineering services to Manitoba, national and international clients, in product design, product development and testing from its Winnipeg facilities. MRC's capabilities in Advanced Manufacturing Technology include state-of-the-art computer-aided engineering. MRC helps industrial clients increase their efficiency and productivity and provides assistance at all stages of the product development cycle, from concept evaluation to test market launch. By using MRC's professional and integrated services in mechanical engineering, electronics, materials science and computer-aided engineering, Manitoba companies can become more competitive regionally, nationally and internationally.

Electronics Engineering

Electrical and electronics engineering provides design and product development assistance. Design services include electronic circuit design, printed circuit board design, communications systems design and industrial applications. Product development services include product selection assistance, product testing, evaluation and electronic retrofitting of manufacturing equipment.

Mechanical Engineering

Mechanical engineering provides specialized product design and analysis services. Technical capabilities include functional analysis, structural integrity assessments, system dynamics studies and evaluations of safety and cost effectiveness. Specialized services are available in vibration analysis, noise control, finite element analysis, solids modelling and computer-aided engineering.

ENVIRONMENTAL MONITORING AND ANALYTICAL CHEMISTRY SERVICES

Through our Winnipeg facility, a wide range of chemical and environmental services are provided to industry. Capabilities include industrial and hazardous waste analysis, workplace air quality monitoring, fuels and lubricants testing, testing for hydrocarbons and other environmental contaminants, monitoring for sick building syndrome and troubleshooting quality control problems. These services help Manitoba companies comply with environmental and workplace health and safety legislation and also assist in solving production problems or in developing new technologies or products.

NATIONAL AGRI-FOOD TECHNOLOGY CENTRE (NAFTC)

The Manitoba Research Council provides food technology services to Manitoba, national and international food, feed and beverage industries through the NAFTC in Portage la Prairie. NAFTC provides clients with access to an integrated research, product development, testing and a pilot-scale production facility. It offers clients the expertise and experience of a dedicated team of food scientists, engineers, technicians and consultants, the resources clients need to develop new and better products, and more cost-effective production techniques.

Food Product Development

Product development activities range from turning an idea into a new food product to finding uses for by-products. Expertise and equipment are available to conduct flavour, colour and texture analyses as well as sensory evaluation to suit home, restaurant and institutional food requirements.

Food Engineering

Food engineering services include consulting assistance in process development and optimization, equipment specification and selection, plant layout and design, and energy conservation.

Pilot Plant

The pilot plant is equipped and serviced for production of new food products on a trial basis. Technical skills and equipment are available to assist with process development in the areas of dairy and meat products, fruit and vegetables, and cereal technology (including baking). Processing capabilities include cooking, blanching, freezing, battering and breading, drying and membrane separation. The pilot plant is Meat Hygiene Directorate inspected so test products containing meat can be distributed interprovincially and internationally.

Microbiology

Microbiological laboratories are equipped to evaluate food for spoilage and pathogenic organisms. Facilities for both enumeration and identification are available on site. Services also include consulting assistance in food plant sanitation and microbiological procedures.

Food and Analytical Chemistry

Analytical chemistry services range from routine protein, fat and moisture determination to sophisticated tests for trace constituents and contaminants, such as vitamins and pesticides. The laboratory has achieved Agriculture Canada accreditation for sulfathiazole residue in honey and is seeking accreditation for pesticide residues in fruits and vegetables and chemical analysis of milk powders and egg products.

TECHNICAL INFORMATION AND ADVISORY SERVICES

The Manitoba Research Council offers technical information and technological advice to Manitoba industry. This program includes information and advisory services funded by the Province and by two contribution agreements with the National Research Council of Canada for the delivery of the Industrial Research Assistance Program (IRAP); and the Research Institute Support Program (RISP). Through these services and programs, MRC helps industry solve technical problems, improve productivity and introduce new materials, equipment and technology. In 1990/91 approximately 10,000 significant client contacts were made by MRC staff. Of these, approximately 35% were made with rural-based companies.

There is no charge to industrial clients for services under this program. Available assistance includes: on-site technical problem definition and solution development; library services; literature and database sourcing; information on the availability of government assistance programs; demonstrations of PC and mainframe-based CAD/CAM systems; and technical advice to the Regional Development Corporations and other government departments.

Information services are available through MRC's library facilities in Portage la Prairie and Winnipeg. These services provide industrial clients with access to extensive holdings of books, journals, catalogues, standards and government regulations. In addition, world-wide information is available through computer access to more than 300 technical databases. MRC's library staff assists clients in accessing these materials directly or through IRAP.

Typically, MRC libraries handle approximately 100 requests for information every month. Approximately 50% of these requests are from industry, 35% are from MRC staff on behalf of clients, and 15% are from government.

MRC - UNIVERSITY OF MANITOBA JOINT PROGRAMS

Institute for Technological Development (ITD)

The Institute for Technological Development is a co-operative venture among the Manitoba Research Council, the National Research Council, the University of Manitoba and Manitoba industry. The primary objectives of the ITD are to encourage communication between industry and university researchers, to facilitate technology transfer from the University to local industry, and to support co-operative R&D to improve the competitiveness of local industry. ITD performs a variety of technology transfer and networking activities to meet these goals.

Agri-Food Biotechnology Program

The Manitoba Research Council/University of Manitoba Agri-Food Biotechnology program is a co-operative venture between the Food Science Program Department and the Manitoba Research Council. The Agri-Food Biotechnology laboratories are located in the Food Science Department, University of Manitoba.

Dr. J. Zawistowski was appointed MRC/UofM Biotechnologist in late November 1988. Since this time, the Program has developed to become strong both in the areas of applied research and development, and basic scientific research. A major contract was completed for a private sector firm in which monoclonal antibodies specific to a selected soil microorganism were successfully isolated and tested. In addition, the Program has received research grants from agencies such as NSERC, Agriculture Canada and the Western Grain Research Foundation for over $100,000 this fiscal year.

Currently the program has three graduate students at the M.Sc. level supervised by Dr. Zawistowski. In addition, through research grants and contributions from the U of M the equipment inventory of the Agri-Food Laboratory has increased significantly.

It is apparent that the Lab Program is rapidly developing credibility both on a national and international level. Dr. Zawistowski has been invited to address conferences outside of Canada and, as well, has developed a co-operative working relationship with a research team in Australia.

Advanced Industrial Materials Program

The Advanced Industrial Materials (AIM) program has been mandated to pursue research and development of new materials and processes, to strengthen ties between the Faculty of Engineering and MRC for developing collaborative programs in research and teaching, assist local industry in fulfilling their needs in the area of materials engineering, and to foster R&D on the new frontiers of science and technology in the province.

The year 1990-91 was a very productive year. Many R&D contracts from federal agencies such as the Canadian Space Agency were brought to Manitoba through the collaborative efforts of MRC and the UofM. These contracts had both immediate, and potentially long-lasting benefits for the Province. Specifically, program activities resulted in participation of local industry, training of students, creation of high tech jobs and development of local expertise in the new areas of science and technology. Research findings were published in international journals and presented at international conferences.

In addition to ongoing microgravity materials research work, MRC is working co-operatively with the University and others towards the creation of a microgravity test facility in Manitoba.

In addition, several projects of a problem-solving nature were undertaken on behalf of Manitoba industries. MRC staff (Dr. K. Tandon) offered undergraduate courses at the UofM and participated with the Canadian Space Agency in developing a long range plan for their materials science program. The program was also instrumental in creating an Advanced Industrial Materials Network across Canada for promotion of R&D and delivering Industry Science and Technology Canada's program in AIM.

The value of R&D contracts brought into Manitoba through the AIM Program was $160,000 in 1990/91. Approximately $55,000 of this total was revenue for MRC through R&D project work and contract work for industry.

1990/91 HIGHLIGHTS

ENGINEERING SERVICES

- MRC engineering services worked for a number of clients providing testing services, including: setting up a monitoring system to determine the magnitude and frequency of building vibration caused by sporadic material flow in a local industrial processing plant; monitoring and analysis of traffic noise on a provincial highway to determine the effect of barriers on residential noise levels; experimental stress analysis of concrete grain silos to assess their structural integrity; and testing a prototype motor from a snow blower to evaluate specific energy consumption and efficiency.

- Product development projects included: development of a prototype sensor sway for electromagnetic testing of circuit boards; study to assess the costs and requirements to introduce a multi-location game system using telephone lines; conceptual design and prototype manufacture of a hi-lo mat table used for physiotherapy; and concept development and prototype manufacture of a retractible cord reel device.

- The International Development Research Corporation, commissioned a project on behalf of the Pakistan Council of Science and Industrial Research in Pakistan. A dobby mechanism was designed to introduce pattern weaving onto cottage industry looms. A key consideration in the design was to ensure the unit could be manufactured within the technologically limited industrial sector of Pakistan. The product is also to be licensed for manufacture in other third world countries. This project continued with additional field trials taking place in India.

- A project was undertaken for a shoe manufacturing company involving the retrofitting of the electronic control equipment for a pattern generating sewing machine, and the transfer of pattern programs from a tape format to a computer disk format. Five machines have been converted to date.

- A contract research project aimed at developing suitable vibration criteria for purchasers of diesel electric generating sets larger than 100 kw capacity was continued on behalf of the Canadian Electrical Association and Manitoba Hydro.

- A program to monitor three groundwater source heat pump installations in Manitoba continued. This program is co-sponsored by the Canadian Electrical Association, Energy Mines and Resources Canada, Manitoba Energy and Mines and Manitoba Hydro.

Engineering Services (continued)

- The Transportation Development Centre commissioned a project to evaluate the feasibility of the application of multiplexing to intercity coaches. This study includes the assessment of industry practices, system design and cost benefit analysis.

ENVIRONMENTAL MONITORING AND ANALYTICAL CHEMISTRY SERVICES

- Provided analytical services to a number of local consulting firms for hydrocarbon in soil testing on a priority basis to assist in compliance with environmental regulations.

- Assisted a local manufacturer in the development of an ozone generator.

- Conducted a videotaped test procedure for use in an out-of-province court case involving improper disposal of hazardous wastes.

- Monitored for the contaminants present in surface water in order to track the disposal plume resulting from a tank car vinyl outdate spill.

- Assisted in the environmental assessment of a manufacturing plant by aiding in the design and scope of the sampling program, and providing analytical services to determine contaminants in both air and soil samples.

- Provided analytical services to a major gasoline distributor to monitor the chargeout of the underground storage tanks from leaded to unleaded fuel.

- Analysis of a tailings pond from a gold mining operation to determine if the water quality met environmental guidelines.

- Pesticide testing of washings from a study investigating the potential for pesticide container reuse.

- Testing of several products to provide information in the preparation of material safety data sheets for products produced by local manufacturers.

Environmental Monitoring and Analytical Chemistry Services (continued)

- Provided industrial hygiene services to a number of clients, including welding and maintenance shops, printing operations, foundries, paint spray operations, a brewery, a dairy and several offices suffering from sick building syndrome.

- Provided analytical services to a number of companies to assist them in reducing or eliminating the generation of hazardous wastes.

- Provided emergency analytical support in response to environmental concerns over PCB spills.

- Maintained the laboratory's proficiency rating in the National Institute for Occupational Safety and Health Proficiency Analytical Testing Program.

NATIONAL AGRI-FOOD TECHNOLOGY CENTRE

- A value-added wild rice product was developed for a Manitoba processor wishing to expand the market for its wild rice. The company intends to market the value-added product to the foodservice trade.

- A Manitoba processor of convenience foods required shelf-life testing to verify the success of a new packaging technology. These retail products are presently available in Manitoba.

- Consumer testing of value-added vegetable products was conducted for a national company. The company required an independent assessment of the products' quality to supplement in-house results.

- Production and packaging of several products for retail sale took place during the year in MRC's food pilot plant: a specialty bread, goats' milk, pizza crusts and sauce, seasoning mixes and chicken products.

National Agri-Food Technology Centre (continued)

- Several meat processors had products tested for compliance with federal compositional standards, nutritional quality factors such as protein, fat, lean and cholesterol, and for nutritional labelling.

- Comprehensive testing for products of the Manitoba Liquor Control Commission continued, as the main thrust of their quality control program.

- A national fast-food chain in conjunction with a Manitoba-based food processor used MRC on two separate occasions for the trial production of new and more nutritious food products. With a multi-disciplinary approach, employing expertise from the two private sector firms and MRC, both projects were rated as highly successful and the fast-food chain is marketing the products developed at MRC.

- A long-term project initiated in 1988 for a Portage la Prairie-based development corporation was concluded. MRC personnel were involved in all facets of evaluating the potential of expanding the fruit and vegetable processing sector in Manitoba. The investigation involved the following: determination of market potential for Manitoba-processed fruits and vegetables; pilot-scale processing and evaluation of selected fruits and vegetables grown in the Portage la Prairie area; comparison of locally-grown processed materials with materials presented on the market and the capital cost of constructing a food processing plant. It was found that processed Manitoba crops were at least comparable to those currently available on the market.

- In conjunction with a private Winnipeg consulting firm, MRC played a key role in evaluating the use of nanofiltration membrane technology. This new technology was applied to waste streams from a potato processing plant to concentrate the sugars for ethanol production by fermentation. It was concluded that the fermentation of waste stream products by the company to produce ethanol was economically viable.

TECHNICAL INFORMATION AND ADVISORY SERVICES

- A honey processing and packing operation received recommendations on the design and installation of equipment to handle seed honey in a processing operation and also received assistance in establishing a quality control program. The company has since been successful in obtaining a private label contract with a major food chain.

- A small local cosmetics manufacturer requested assistance with a plant layout to improve the flow of materials and productivity in his facility. Several layout alternatives were developed and the company estimates benefits of $10,000 from this assistance.

- A rural Manitoba company manufacturing promotional items identified a need for the assistance of a designer to enable them to proceed with the development of a new cottage industry. Several possible candidates were identified. The company is now proceeding and anticipates employing five people in their own homes to produce sales of $50,000 to $80,000 in the first year.

- A local die-casting company was assisted with a product design problem. The company has indicated this assistance will result in additional sales of $50,000 in the first year and as much as $150,000 in the following year.

THE BOARD OF DIRECTORS

Mr. Russ Hood (Chairman)
UMA Group

Dr. John Wade (Vice Chair)
Department of Medicine, UofM

Mr. Dave Anton
Mutual Group

Mr. Terry Clark
ACCRO Furniture Industries

Dr. Harley Cohen
University of Manitoba

Mr. Hugh Eliasson
Industry, Trade and Tourism

Mr. Gerald Gray
Blackwoods Beverages Ltd.

Mr. Robert Hamaberg
Standard Aero Limited

Ms. Susan Nemec-Hitesman
Deloitte & Touche

Ms. Irene Palmer
Finalco Securities Canada Limited

Mr. Fern Pitre
Abitibi-Price Inc.

Mr. Ed Prefontaine
Rescom Ventures

Mr. Bob Silver
Western Glove Works Ltd.

Mr. Frank Sissons
Sissons Farms Ltd.

Mr. Paul Soubry
Ford New Holland Canada Ltd.

MRC wishes to thank the following Board members whose term of service expired during 1990/91:

Mr. John Ingraham (Vice Chairman)
IDS Ventures Ltd.

Mr. Bert Beattie
Bristol Aerospace

Dr. Nancy Craven
Clinicom Computing Services Intl. Inc.

Mr. George Ubell
Acme Medallion Furniture

Dr. Ken Pulfer
APRO National Office

Mr. Derek Johannson
Carlyle Computer Products

MANITOBA RESEARCH COUNCIL STAFF

Acting President, J. Reichert, Ph.D., P.Eng.

Secretary to the Board, J. Nowoselski

Finance & Administration Division

Acting Vice-President, Finance/Admin.
W. Kinnear, C.A.

Accounting
R. Osato (Manager)
L. Baker
S. Kowalski
L. Szwarek
K. Taylor

Administrative Support
G. Barber
M. Bouchard
E. Harman
J. Lenton
B. McNeill
F. Nicholls
M. Powell
A. Shaw-Porteous
M. Schmidt
A. Tidsbury
G. Vause

Marketing Division

Director of Marketing
D. Shambrock, B.S.A., M.Sc., M.B.A.

Business Development
G. Montgomery, Dip. Mech. Tech., B.Sc. (Agric)
K. Puckall, B.Sc.(M.E.), P.Eng.

Institute for Technological Development
J.H. Hilliard, Ph.D.

Technical Information and Advisory Services Division

IRAP Field Advisory Services
D. Deley, B.Sc.(M.E.), P.Eng. (Manager)

P. deGraaf, B.Sc.(M.E.), P.Eng.
W. Herwig, B.Sc.(M.E.), P.Eng.
D. Osman, B.Sc.(C.E.), P.Eng.
W. Rempel, B.Sc.(A.E.), P.Eng.
D. Robertson, B.S.A., M.Sc.

Libraries
B. Dearth, M.I.L.S.
B. Ortega, Cert. Lib. Tech., B.A.
K. Rytter, Cert. Lib. Tech.

Operations Division

Vice-President, Operations
(Vacant)

Engineering Services

T. Cornell, B.Sc.(M.E.), P.Eng. (Manager)

J. Begin, B.Sc.(A.E.), M.E., P.Eng.
G. Chen, B.Sc.(A.M.), M.Sc., Ph.D.
A. Dennett, Dip. Computer Tech, C.E.T.
V. Ilg, B.Sc.(M.E.), P. Eng.
G. Kibria, B.Sc.(M.E.), M.Sc., P. Eng.
T. Kozlyk, C.E.T.
Y. Muzyka, B.Sc.(M.E.), P.Eng.
E. Paryzek, B.Sc.
J. Peterson, B.Eng., P.Eng.
G. Ruttig, Dip. Mech. Tech., C.E.T.
P. Slawinski, Dip. Mech. Tech., C.E.T.
J. Vetesnik
L. Vuignier, Dip. Drafts Tech.
D. Zvanovec, Dip. Mech. Tech.

Advanced Industrial Materials Program
K. Tandon, B.Sc. (Met. E.), Ph.D., P.Eng.

Environmental Monitoring and Analytical Chemistry Services
G. Lypka, B.Sc., M.Sc. (Manager)
A. Bixo, Dip. Chem. Eng.
S. Collin
M. Duguay, B.Sc.
T. Jillette, Dip. Chem. Tech.
S. McKendry-Smith, B.Sc.
K. Takatch, Dip. Env. Eng. Tech.
M. Velpel, Dip. Biochem. Tech.
A. Wojtowicz, B.Sc.

Food and Analytical Chemistry
G. Lypka, B.Sc., M.Sc. (Manager)
M. Brown, B.Sc.
K. Charrier, B.Sc.
D. Driedger, B.Sc., M.Sc.
R. Henderson, Dip. Chem. Tech.
P. Oltmann, B.Sc., Ph.D.
D. Roberts, B.S.A.
L. Wiebe

Food Product Development
V. Sullivan, B.S.A. (Manager)
K. Andrews, B.H.Ecol.
M. Flemington
J. Meseyton, B.H.Ec.
R. Sampson

Food Technology
T. Smyrl, B.Sc., M.Sc., Ph.D. (Manager)
D. Cann, B.Sc.
G. Gherasim
D. Jacklyn
C. Johnson
P. Moberly
L. Murray, B.Sc.

Agri-Food Biotechnology Program
J. Zawistowski, Ph.D.

MANITOBA RESEARCH COUNCIL LOCATIONS

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The Manitoba Research Council is a member of the Association of Provincial Research Organizations Inc.

Manitoba

Office of the Provincial Auditor

THE MANITOBA RESEARCH COUNCIL

Auditor's Report and Financial Statements
for the year ended March 31, 1991

MANAGEMENT REPORT

The accompanying financial statements of the Manitoba Research Council are the responsibility of management and have been prepared in accordance with the accounting policies stated in the financial statements. These accounting policies have been applied on a basis consistent with that of the preceding year. In management's opinion, the financial statements have been properly prepared within reasonable limits of materiality, incorporating management's best judgement regarding all necessary estimates and all other data available up to July 8, 1991.

Management maintains internal controls to provide reasonable assurance of the reliability and accuracy of the financial information and that the assets of the Manitoba Research Council are properly safeguarded.

The responsibility of the Provincial Auditor is to express an independent, professional opinion on whether the financial statements of the Manitoba Research Council are fairly presented in accordance with the accounting policies stated in the financial statements. The Auditor's Report outlines the scope of the audit examination and provides the audit opinion.

On behalf of Management

J. K Reichert

Dr. J. K. Reichert
Acting President

W. Kinnear
Acting Vice-President,
Finance & Administration

R. Osato
Manager,
Finance & Administration

July 8, 1991
Date

Office of
the Provincial Auditor

905 - 386 Broadway
Winnipeg, Manitoba, CANADA
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AUDITOR'S REPORT

To the Legislative Assembly of Manitoba

We have audited the balance sheet of The Manitoba Research Council as at March 31, 1991 and the statement of revenue and expenditure and funds retained for future operations and the statement of changes in cash resources for the year then ended. These financial statements are the responsibility of the Council's management. Our responsibility is to express an opinion on these financial statements based on our audit.

We conducted our audit in accordance with generally accepted auditing standards. Those standards require that we plan and perform an audit to obtain reasonable assurance whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation.

In our opinion, the financial statements present fairly, in all material respects, the financial position of the Council as at March 31, 1991 and the results of its operations for the year then ended in accordance with the accounting policies stated in note 2 to the financial statements.

Winnipeg, Manitoba
July 8, 1991

F. H. Jackson, CA
Provincial Auditor

THE MANITOBA RESEARCH COUNCIL

EXHIBIT A

Balance Sheet
as at March 31, 1991
(with 1990 figures for comparison)

ASSETS	1991	1990
Current:		
Cash	$ 7,000	$ 7,000
Funds on deposit with the Minister of Finance:		
Trust accounts	97	177,993
Term deposits	442,065	1,174,514
	442,162	1,352,507
Accounts receivable and accrued revenue:		
Government of the Province of Manitoba	2,191	585
Other, net of allowance for doubtful accounts of $23,974 (1990 - $69,623)	461,839	399,859
	464,030	400,444
Prepaid expenses	49,480	57,966
	962,672	1,817,917
Fixed (Notes 2c and 4)	459,393	387,435
	$1,422,065	$2,205,352

LIABILITIES AND FUNDS RETAINED FOR FUTURE OPERATIONS		
Current:		
Accounts payable and accrued liabilities (Note 3)	$ 665,682	$ 499,211
Current portion of loan payable (Note 6)	17,341	15,755
Advances on contracts	10,121	6,177
	693,144	521,143
Loan payable (Note 6)	23,488	40,829
	716,632	561,972
Funds retained for future operations, Exhibit B	705,433	1,643,380
	$1,422,065	$2,205,352

THE MANITOBA RESEARCH COUNCIL

EXHIBIT B

Statement of Revenue and Expenditure and Funds Retained for Future Operations for the year ended March 31, 1991 (with 1990 figures for comparison)

	1991	1990
Revenue:		
Grants from the Government of the Province of Manitoba	$2,714,700	$2,711,400
Contracts	2,079,599	2,836,748
Interest	117,551	152,251
Gain on sale of building	-	57,000
Sundry revenue	17,741	5,649
Total revenue	4,929,591	5,763,048
Expenditure, Schedule 1	5,867,538	5,583,784
Excess of expenditure (over) under revenue	(937,947)	179,264
Funds retained for future operations, beginning of year, as previously stated	1,883,538	1,710,108
Adjustment to reflect change in accounting policy (Note 3)	(240,158)	(245,992)
Funds retained for future operations, beginning of year, as restated	1,643,380	1,464,116
Funds retained for future operations, end of year	$ 705,433	$1,643,380

THE MANITOBA RESEARCH COUNCIL

EXHIBIT C

Statement of Changes in Cash Resources
for the year ended March 31, 1991
(with 1990 figures for comparison)

	1991	1990
Operating activities:		
Excess of expenditure (over) under revenue	$ (937,947)	$ 179,264
Items not involving cash:		
Depreciation	106,395	45,635
Write-off of obsolete software	27,896	-
Gain on sale of fixed assets	(985)	(54,414)
Net change in non-cash working capital balances:		
Accounts receivable	(63,585)	(13,331)
Prepaid expenses	8,486	(24,603)
Accounts payable	170,416	(89,355)
	(689,324)	43,196
Financing activities:		
Loan repayment	(15,756)	(13,319)
Investing activities:		
Fixed asset additions	(207,415)	(173,221)
Proceeds from disposal of fixed assets	2,150	138,057
	(205,265)	(35,164)
Decrease in cash and funds on deposit	(910,345)	(5,287)
Cash and funds on deposit, beginning of year	1,359,507	1,364,794
Cash and funds on deposit, end of year	$ 449,162	$1,359,507

THE MANITOBA RESEARCH COUNCIL

SCHEDULE 1

Schedule of Expenditure
for the year ended March 31, 1991
(with 1990 figures for comparison)

	1991	1990
Expenditure (Note 5):		
Advertising and promotion	$ 165,708	$ 229,666
Bad debts	23,974	61,237
Building maintenance and repair	94,201	61,278
Computer related expenses	165,015	142,661
Depreciation	106,395	45,635
Equipment - rentals, maintenance and repair	51,520	81,034
Fees - memberships, seminars, customs and audit	139,578	111,449
Heating and utilities	97,599	99,615
Interest on loan	6,164	8,646
Laboratory supplies	200,798	261,755
Library - consultants and publications	53,184	59,216
Miscellaneous	1,497	15,298
Postage, delivery and telephone	135,811	138,049
Printing and stationery supplies	56,662	107,653
Purchased testing services	64,047	43,098
Real estate rental and property taxes	264,135	250,338
Salaries and employee benefits	4,025,617	3,713,885
Staff transfer and relocation costs	46,197	275
Travel and transportation	169,436	152,996
Total expenditure, Exhibit B	$5,867,538	$5,583,784

Notes to Financial Statements for the year ended March 31, 1991

1. **Nature of Operations**

The Manitoba Research Council was established in 1963 with the following objectives:

a) to promote and carry on research and scientific enquiries respecting agriculture, natural resources, industry or other segments of the economy of the province; and

b) to secure for Manitoba the benefits of research and scientific enquiries carried on elsewhere.

The Manitoba Research Council operates two laboratory facilities, one in Winnipeg and the other in Portage la Prairie.

2. **Significant Accounting Policies**

a) These financial statements are prepared on the accrual basis of accounting.

b) Revenue from the majority of contract work is recognized on the percentage-of-completion method which recognizes revenue as a contract progresses. Unbilled revenues are accrued to the year end for these contracts, while pre-billed revenues received are classified as deferred revenue.

Revenue from analytical lab work, involving shorter term contracts without substantial outlays of direct costs, is recognized on a completed contract basis.

c) Fixed assets are recorded at cost, less applied grant funds and accumulated depreciation. Depreciation is calculated on a straight-line basis at the following rates:

Automobiles	20%
Computer equipment	20%
Equipment	10%
Furniture and fixtures	10%
Computer software over $10,000	33 1/3%

In the current year an exception to the policy occurred when certain accounting software became inoperable and was written off in the amount of $27,896. The related hardware was thus rendered obsolete and was fully depreciated by an additional charge to depreciation of $31,430.

d) Certain general and administrative services and facilities are provided by the Province of Manitoba at no cost to the Council. These costs are not reflected in the financial statements. (Note 5)

THE MANITOBA RESEARCH COUNCIL

Notes to Financial Statements for the
year ended March 31, 1991

3. Change in Accounting Policy

During the year the Manitoba Research Council adopted, on a retroactive basis, a change to the accrual basis of accounting for employee vacation and overtime. The Council previously accounted for employee vacation and overtime on a cash basis. This retroactive change in accounting policy resulted in an increase in accounts payable and accrued liabilities of $250,819 and $240,158 at March 31, 1991 and 1990 respectively, a decrease in the Funds Retained for Future Operations at March 31, 1989 of $245,992, an increase in salaries expense for the year ending March 31, 1991 of $10,661 and a decrease in salaries expense for the year ending March 31, 1990 of $5,834.

4. Fixed Assets

a) Fixed assets owned by the Manitoba Research Council may be summarized as follows:

	Cost	Funded by Government of Canada	Accumulated Depreciation and Assets Charged to Operations	Book Value
Automobiles	$ 20,000	$ 20,000	$ -	$ -
Computer Equipment	1,498,767	552,053	839,444	107,270
Equipment	4,423,241	1,825,149	2,255,156	342,936
Furniture and Fixtures	105,438	53,516	42,735	9,187
	$6,047,446	$2,450,718	$3,137,335	$459,393

b) Reserve for Commencement of Depreciation Policy

Effective April 1, 1988, the Council changed its accounting policy for the recording of fixed assets. Previously fixed assets acquired were charged to operating expenditures in the year of acquisition. The new policy was to capitalize fixed asset acquisitions and depreciate them over the estimated useful life of the asset in a manner consistent with generally accepted accounting principles.

The change in accounting policy was initiated by determining the amount of depreciation that would have been charged in prior periods under the new policy and reflecting $1,708,176 as the undepreciated value of fixed assets at April 1, 1988 in the accounts. This amount was also shown as an adjustment of the opening balance of Funds Retained for Future Operations

as of April 1, 1988 on Exhibit B. Prior period figures were not restated to reflect this change in accounting policy.

The Board of Directors, effective March 31, 1991, approved the cancellation of the Reserve for Commencement of Depreciation Policy by decreasing the depreciation charge for the year by $242,585, by increasing the accumulated depreciation account (computer equipment $23,659, equipment $678,140, furniture and fixtures $8,994) for fixed assets by $716,793 and by writing off the March 31, 1990 balance of the Reserve for Commencement of Depreciation Policy of $953,378.

5. Administrative Expenditure

The Government of the Province of Manitoba incurs certain expenditures on behalf of the Council, including annual rent for the Council's laboratory and related land located in Portage la Prairie. For 1991, rental expenditure incurred by the Province was $74,400, (1990 - $105,100). (The 1990 figures are composed of the following: rental for the Portage la Prairie property - $74,400; rental of Bay 11 at 1329 Niakwa Road - $26,600; estimated administrative expenses $4,100.)

6. Loan Payable

The 10 year loan payable to Winpark Realty Inc. for leasehold improvements maturing May 1, 1993, bears interest at 14.25% and is repayable in blended monthly instalments of $1,827. Principal repayments to maturity are as follows:

1992	$ 17,341
1993	19,900
1994	3,588
	40,829
Less: Current portion	17,341
	$ 23,488

If the Council fails at any time prior to May 1, 1993 to be the tenant or subtenant of the premises, the unpaid principal and accrued interest shall become due and payable immediately.

7. Pension Plan

In accordance with provisions of The Civil Service Superannuation Act, employees of the Council are required to contribute to The Civil Service Superannuation Fund at prescribed rates for defined benefits. The Council is required to make contributions equal to the amount contributed to the Fund by employees. For 1991 the amount contributed by the Council was $176,302 (1990 - $169,175). Under this Act, the Council has no further pension liability.

THE MANITOBA RESEARCH COUNCIL

Notes to Financial Statements for the year ended March 31, 1991

8. Comparative Figures

Comparative figures for the year ended March 31, 1990 have been restated to conform with the presentation adopted for the current year.